

PROSPECTUS
FOR
INTEGRATED AGRICULTURAL PRODUCTS
PROCESSING PROJECT

August, 1971

The Government of the Republic of Korea
Seoul, Korea

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Summary of the Project

1. Project Title: Integrated Agricultural Products Processing Project
2. Project Sponsor: The Agriculture and Fishery Development Corporation (AFDC)
3. Estimated Cost of the Project:

| | <u>Won (million)</u> | <u>US\$ (thousand)</u> |
|--------------------------------|----------------------|------------------------|
| Domestic financing | 10,597 | \$28,641 |
| Loan requested | 6,561 | \$17,732 |
| For foreign exchange financing | (1,106) | (\$ 2,989) |
| For local currency financing | (5,455) | (\$14,743) |
| <u>TOTAL COSTS</u> | <u>17,158</u> | <u>\$46,373</u> |

4. Project Description:

The proposed Project is aimed at facilitating integrated development of an export-oriented food industry ranging from the production of raw materials to processing and marketing. Primary emphasis is placed on three selected commodities with the greatest export potential; mushrooms, asparagus and strawberries. The planned multiproduct processing operations are intended to achieve optimum utilization of plant facilities and work force in order to ensure viability and profitability. Maximum participation by private entrepreneurs and farmers would be encouraged. The above-mentioned

three types of agricultural crops have been chosen in light of their labor-intensive nature, marketability and adaptability to climatic and soil conditions in Korea.

5. Project Benefits:

The expected contributions of the Project at full development to the national economy are summarized as follows:

| <u>Product</u> | <u>Yearly employment at factory and on farm (1000 man/days)</u> | <u>Income of farmers and factory employees per Yr. (won million)</u> | <u>Yearly export earnings (US\$ 1000)</u> |
|---------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------|
| Mushrooms | 5,500 | 2,050 | 32,908 |
| Asparagus <u>1/</u> | 140 | 377 | 1,620 |
| Strawberries | 1,240 | 1,050 | 7,200 |
| TOTAL | 6,880 | 3,477 | 41,728 |

1/ As for asparagus, the Project calls for the execution of only two relatively small-scale pilot projects intended to demonstrate cultivation methods to farmers. Korea is considered to have the potential to export \$20 million worth of asparagus. The difficulty of developing an asparagus industry lies in the fact that an asparagus farm requires four years in reaching maturity.

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I. INTRODUCTION

This is a preliminary proposal for a long-term agro-industrial development program in Korea centered on a few selected products with high export potential.

The proposed "Integrated Agricultural Products Processing Project" calls for sharp expansion in the production and processing of mushrooms, asparagus and strawberries in the main which are all labor-intensive crops peculiarly suitable for development in Korea. Several other types of product would also be developed in order to achieve fully viable multiproduct processing operations. The mushroom industry is already a fast growing export industry. But an asparagus and a strawberry industry would have virtually to be started from scratch.

The estimated total costs of the Project are equivalent to US\$46.4 million, of which only US\$3 million would represent the foreign exchange component. Therefore, it is proposed that an international development loan of US\$18 million be made available primarily to generate local currency funds for financing the Project.

The Project, at full development, would increase Korea's agricultural exports by at least US\$35 million. And it can be anticipated that the great stimulus to be provided by this project to Korea's food processing and agricultural industry would have a profound impact on the development of various allied industries as well as the agricultural sector as a whole.

II. BACKGROUND

A. Need for Accelerated Agro-Industry Development in Korea

In sharp contrast with the notable progress in industrialization of the Republic of Korea in recent years, this country's agricultural sector has been remaining relatively dormant, with low levels of productivity and income prevailing through most of her rural areas. Thus Korea's agriculture is still dominated by small-holding subsistence-type farming centered on such staple food crops as rice and barley.

To more effectively develop Korea's rural sector economy, it is considered essential to break out of the traditional pattern of agricultural production and shift vigorously to more profitable farm products, aimed principally at export markets. The principal asset favoring such a development strategy is the large reservoir of underutilized rural labor of good quality. This is because the demands in high-income countries for labor-intensive agricultural products are steadily expanding currently, whereas the production of such products in developed countries is being impeded by rising wages.

Korea is now afforded excellent opportunities to take advantage of such world market trends in certain types of farm products. This is high time for her to increase her efforts to systematically develop and integrate industries for producing, storing, processing and marketing exportable agricultural commodities that

indicate good profit-earning potential.

Agro-industrial development along such a direction would no doubt increase rural income significantly, thereby greatly contributing to overcoming the weakest link in the overall economic structure of Korea. At the same time, increased foreign exchange earnings through the Project would materially improve Korea's balance of payments position.

B. The Role of the Agriculture and Fishery Development Corporation

The Agriculture and Fishery Development Corporation (AFDC) was founded on December 1, 1967, under a special law aimed at raising the levels of rural income through expediting agribusiness development.

The creation of this rather unique development corporation was necessitated by the fact that in a developing country like Korea where capital is in short supply and its costs are high, private money for long-term development in the agriculture-related fields is hard to come by. Moreover, there was obvious lack of technical skills and managerial and financial capabilities on the part of existing private agribusiness firms to overcome various difficulties in agro-industrial development in Korea.

One initial objective of the AFDC, therefore, was to demonstrate that it was not "next to impossible" to develop viable agro-

industry projects, only if proper technical, financial and administrative resources were concentrated on well selected areas.

Because of the initial difficulty with enlisting private capital participation in its development program, the AFDC had to go into a kind of holding-company operation during its early years of activity. The aim was basically to push ahead with pilot projects in strategic sectors, especially where the scale or nature of projects could hardly be coped with private efforts alone.

During a little over three years of its existence, the AFDC established 21 subsidiary and affiliated companies to carry out development projects in diverse fields, ranging from frozen foods and cold storage to livestock production, silk industry, food processing, marine culture and container manufacturing.

In many instances, the AFDC projects have been involving the development of agricultural raw materials production, integrated with processing and marketing activities. One notable AFDC accomplishment is the development of a once-floundering mushroom industry in the country into a fast growing export industry with great future potential.

With valuable experience gained through its pioneering operations in the past few years, the AFDC now plans to carry out a longer-term agro-industry development program centered on mushrooms and a few other agricultural products with good export marketing prospects and high growth potential. The implementation of such a

program would have a far-reaching effect on rural development in this country.

In its future operations, the AFDC will place even greater emphasis on private participation and initiative in the formulation and execution of development projects. At the same time, the AFDC will pursue its policy of turning its holdings in its subsidiaries and affiliates over to private hands as soon as the enterprises are proved sufficiently viable and profitable.

C. Current Status of the Industry to be Assisted

For years, attempts to grow mushrooms in Korea foundered badly because of failures to develop system of cultivation suited to Korea's natural and socio-economic conditions. But the difficulty with mushroom culture has recently been well overcome, with the research staff of the AFDC playing a major part in developing the design for mushroom houses and mushroom cultivation techniques that can be economically applied in the country.

Once the breakthrough was achieved, a minor boom started in the mushroom industry. Because of favorable climatic conditions, the quality of Korean mushrooms turned out to be superior to that of other producing countries. Much larger orders for Korean mushrooms than could be fulfilled by the infant industry. With an active government policy for the encouragement of mushroom production and processing, Korea's

mushroom exports have been increasing by leaps and bounds in recent years. The development of mushroom production is also giving a big boost to Korea's food processing industry at large.

Although traditional varieties of strawberries have been produced in considerable quantities in Korea for many years, only recently the trial cultivation of imported varieties suitable for processing was undertaken under the sponsorship of the AFDC. The experimental cultivation of new strawberry varieties has proved a success, and a trial frozen strawberry pack has been exported to test the market. The test product was well received. However, commercial production of frozen and other strawberry products for export purposes has not yet been developed. In the case of asparagus also, only experimental cultivation has been undertaken.

The following table shows the growth trends of the Korean mushroom industry.

Mushroom Industry in Korea

| Year | Area of culture beds (pyong) <u>1/</u> | Raw tissue output (m.t.) | Quantity of mushrooms (m.t.) | packed (case) <u>2/</u> | Average price per case (US\$) | Total export value (US\$ 1000) |
|------|----------------------------------------|--------------------------|------------------------------|-------------------------|-------------------------------|--------------------------------|
| 1965 | 33 | 106 | 30 | 1,300 | 6.30 | 8 |
| 1966 | 209 | 1,367 | 724 | 32,100 | 10.60 | 339 |
| 1967 | 299 | 1,732 | 866 | 38,600 | 13.10 | 490 |
| 1968 | 199 | 2,605 | 1,462 | 64,800 | 4.70 | 303 |
| 1969 | 153 | 3,862 | 2,313 | 112,421 | 12.10 | 1,346 |
| 1970 | 235 | 5,958 | 4,814 | 227,777 | 13.60 | 3,095 |

1/ One pyong equals 3.3 square meters.

2/ Equivalent in standard cases each containing 24 16-oz. cans.

III. THE PROJECT

A. Brief Description

This Project is aimed at developing multiproduct food processing facilities for packing mushrooms, strawberries, green asparagus, white peaches and a few additional products, while at the same time developing the production of those agricultural commodities needed to supply the food plants. The major emphasis will be placed on the development of products with good export potential, with subsidiary lines installed for the domestic market to serve as a complementary factor.

The reasons for choosing the above-mentioned products as the targets of development effort under the Project are as follows:

- 1) Mushrooms, strawberries and asparagus are all labor-intensive crops. In view of the large reservoir of rural labor of good quality readily available in Korea, their cultivation will be a good way to utilize the rural work force more productively.
- 2) The mushroom industry is already a fast growing export industry. At present, Korea cannot fill orders for her mushrooms from abroad because of inadequate production. On account of their superior quality, Korean mushrooms are being traded on the world markets at premium prices. Korea's canned mushroom exports increased from only

US\$339,000 in 1966 to \$3 million in 1970. The projection for 1971 calls for the export of \$6.7 million worth of mushrooms.

- 3) Processing lines for such other crops as strawberries and asparagus can be easily added to the existing mushroom processing plants. Such combined processing operations will not only reduce the capital investment requirement but also increase the utilization rate of processing facilities, thereby greatly improving the profitability of the industry.
- 4) The Project proposes to produce green asparagus, the demand for which is increasing the world over and which will compete favorably with white asparagus exported by Taiwan. Import demands for strawberries (mostly in frozen form) are also rising steadily in Japan and the United States.
- 5) Processing of other foodstuffs, such as raspberries, blackberries, white peaches, broccoli, green peas, etc., can also be added to the proposed multiproduct processing plants. These products also have good export potential. The planned canning, glass packing, freezing and cold storage facilities will also be utilized to produce various food products for domestic markets as well, contributing

significantly to the development of the food industry in general and diversified farming.

The project envisions expansion and improvement of existing facilities in addition to construction of new plants. It also would assist farmers to develop the production of raw materials. Highlights of the Project are as follows:

(a) Processing facilities

Credit to agricultural processing companies for the construction of eight new processing plants and also for the improvement and expansion of 33 existing ones.

Technical and financial assistance would in particular be provided for converting the current, inefficient batch-type processing operation into more efficient continuous-type system to lower production costs while improving product quality. These processing facilities would include mushroom canning and glass packing lines, asparagus packing lines, fruit and vegetable freezing equipment, cold storage facilities and other related facilities. It is expected that in addition to frozen strawberries, frozen and freeze-dried mushrooms and frozen asparagus would also be produced.

(b) Agricultural Production

Credit to packers and farmers for building mushroom

growing houses and developing strawberry and asparagus farms. Credit also for the expansion and improvement of spawn production facilities to supply mushroom growers and for the development of nurseries to propagate strawberries, asparagus and other crops.

(c) Marketing and Technical Assistance

Finance for the establishment of a central export marketing organization as an arm of the AFDC to provide a unified export sales channel for participating firms in the Project and extend technical services to improve the production and processing of farm commodities; finance for training centers and extension services for the farmers; and public subsidy for covering 80% of the cost of spawn supplied to farmers.

(d) Working Capital Loans

Production credits for farmers and working capital loans to processors.

The Project is expected to result in sharp increases in the export of agricultural products from Korea. The export of mushroom products alone would rise to US\$33 million, from the projected 1971 level of \$6.7 million. Because it takes four years for newly planted asparagus to reach maturity, the progress in the development of an asparagus industry will inevitably slow initially. Under the Project,

only two pilot-type asparagus sub-projects are planned with the aim of attaining an annual export of \$1.6 million at full development. If the pilot projects should encourage private efforts to develop asparagus production, the actual export volume could be much greater, because it is estimated that Korea has the potential to export US\$20 million in asparagus. The strawberry exports are projected to exceed \$7 million at full development. Further details of the export marketing schedule are shown in the table below.

Processing and Export Marketing Schedule

| Year | Mushrooms | | Asparagus | | Strawberries | | | Total Export Value (\$1,000) |
|------|------------------------------------------------------------|------------------------------|------------------------------------------------------------|------------------------------|---------------------------------|----------------------|--------------------|---------------------------------------|
| | Quantity Processed (Standard Cases) ^{2/} | Export Value (\$1,000) | Quantity Processed (Standard Cases) ^{2/} | Export Value (\$1,000) | Quantity Processed (M.T.) | Export ^{1/} | | |
| | | | | | | Quantity (M.T.) | Value (\$1,000) | |
| 1971 | 413,167 | 6,708 | | | | | | 6,708 |
| 1972 | 663,460 | 10,853 | | | | | | 10,853 |
| 1973 | 955,425 | 15,745 | | | 775 | | | 15,745 |
| 1974 | 1,270,690 | 21,065 | | | 2,430 | 138 | 75 | 21,140 |
| 1975 | 1,649,435 | 27,396 | 15,300 | 137.7 | 5,375 | 1,818 | 1,000 | 28,534 |
| 1976 | 1,935,710 | 32,420 | 42,300 | 280.8 | 7,425 | 3,272 | 1,800 | 34,501 |
| 1977 | 1,935,710 | 32,908 | 81,900 | 737.2 | 10,535 | 6,544 | 3,600 | 37,245 |
| 1978 | 1,935,710 | 32,908 | 136,800 | 1,231.2 | 16,000 | 13,088 | 7,200 | 41,339 |
| 1979 | 1,935,710 | 32,908 | 171,000 | 1,539.0 | 16,000 | 13,088 | 7,200 | 41,647 |
| 1980 | 1,935,710 | 32,908 | 180,000 | 1,620.0 | 16,000 | 13,088 | 7,200 | 41,728 |

^{1/} A considerable portion of frozen strawberries produced would be intended for domestic consumption, whereas the entire quantities of processed mushrooms and asparagus are scheduled to be exported.

^{2/} One standard case contains 24 16-oz cans.

B. Project Areas

The mushroom sub-project would cover many areas of the country widely distributed through all the rice-producing provinces. Rice straw is indispensable to the mushroom culture in Korea, because it is the only abundantly available material for making compost needed to grow mushrooms.

Mushroom cultivation peculiarly suits Korean conditions in view of the climatic conditions, the availability of low-cost labor and the high literacy rate of rural populace. Moreover, mushroom culture does not require much land, because it is carried out inside concrete-bloc houses. The low land requirement is very significant to Korea, where land is scarce and furthermore individual holdings are very small. The mushroom is thus about the only non-cereal agricultural crop that can raise the income level of the majority of Korean farmers.

Thus the mushroom industry can be the backbone of Korea's food processing industry, and the mushroom processing plants would serve as the nuclei for the proposed multiproduct processing activities. It is hardly an exaggeration to say that the future development of Korea's food and agricultural industry critically depends on the mushroom industry being vigorously developed and improved.

Under the proposed Project, a relatively limited number of suitably-located and better-managed mushroom plants will be assisted to develop into multiproduct plants.

In the case of green asparagus and strawberries -- two other key commodities in connection with this Project -- the selection of lands is very important in ensuring high yields and good quality of products.

The planned asparagus farms would be located at five places in sandy loam soil in river banks where potential for asparagus plantation development is found to be great. Initially, the asparagus harvested would be supplied to two plants. When the demonstration project encourages the participation by local farmers in an asparagus-production industry, an increasing number of mushroom plants would be equipped with asparagus lines so as to attain a higher utilization of their plant facilities. In principle, one pilot asparagus farm would be located in each of four provinces where the mushroom industry is under development currently, with the exception of Kyongsang-Pukto, where two farms would be created close together.

Strawberry plantations would also be developed in alluvial sandy loam and along river banks in the four provinces. Already, trial cultivation of imported varieties has been successfully conducted in several counties. The cultivation of other types of berries would be developed in the vicinity of strawberry plantations to supply the freezing plants for their extended operation.

Whenever possible, the production of such other fruits as peaches, apples, grapes and persimmons would also be encouraged in areas close to the processing plants under the Project in order to

achieve further product diversification that would be conducive to fuller utilization of plant facilities and work force.

C. Detailed Features

Mushroom Industry Development

Mushroom growing facilities would be expanded from 247,300 pyong (one pyong equals approximately 3.3 square meters) expected to be attained at the end of 1971 to 638,500 pyong by the target year of 1976. With the construction of more growing houses, the raw tissue output would increase from 11,400 m.t. projected for 1971 to a little over 40,000 m.t. in 1976. The quantity of mushrooms packed would rise from an equivalent of 228,000 standard cases in 1971 to nearly two million cases in 1976. Thus the export earnings through mushroom sales would increase from US\$6.7 million in 1971 to \$32.4 million in 1976. In order to attain such increased packout and sales in an efficient and profitable manner; it is planned to have at least 15,000 pyong of growing areas assigned to each processing plant by the target year. Currently, a processing plant is supplied from an average of 7,500 pyong -- a rather uneconomically low level. The average processing capacity of the mushroom plants would also be expanded from 7 m.t. per 8-hour day to 12 m.t. per 8-hour day. Furthermore, the type of processing facilities would be converted from the present, inefficient batch system to an integrated continuous system. In line with the

the planned expansion in mushroom production, the spawn producing capacity would be increased from the current one million lbs to three million lbs. In the target year, about 60 per cent of the mushroom growing area would be owned and operated by individual farmers or farmers cooperatives, with the remaining 40 per cent to be operated by processing firms. About 3,700 farm households would engage in mushroom culture in the target year, with the mushroom area per household ranging from 100 to 300 pyong (compared to 40 to 100 pyong currently). With improved cultivation and processing techniques, higher yields of raw tissue and finished products would be attained, together with better product quality. In the future, glass packed, frozen and freeze-dried mushrooms would also be produced in addition to tinned products.

Asparagus Industry

The Asparagus Sub-project is a pilot project designed to demonstrate to the farmers that asparagus farming can be a profitable enterprise. Initially, about 400 ha of land would be purchased by the AFDC and one of its subsidiaries to set up model farms. The asparagus harvested would be supplied to two mushroom processing plants for packing with a view to developing multiproduct operations. In 1980, when the pilot project reaches full development, 3,000 m.t. of green asparagus would be produced to make it possible to pack 180,000 standard cases of canned asparagus. The yearly export would reach \$1.6 million. An AFDC survey indicates that Korea has the potential to export \$20

million worth of asparagus annually. It is considered possible that after three years of the pilot farm operation, asparagus farm development can begin to be undertaken on a nationwide basis. The present Project proposal, however, does not cover such probable sharp expansion in asparagus acreage, leaving the matter for future consideration. Under the pilot project, an asparagus line capable of processing 20 m.t. per 10-hour day would be installed at two mushroom plants.

Strawberry Industry

Cultivation of imported varieties of strawberries suitable for freezing would be undertaken in 1,800 ha of land by 1976 to supply five processing plants initially. Each facility, to be annexed to a mushroom processing plant, would bear a freezing capacity of 25 m.t. per 12-hour day and a cold storage capacity of 400 m.t. In 1976, about 7,400 m.t. of frozen strawberries would be produced, and about a third of the pack would be exported earning \$1.8 million in foreign exchange. By the target year of 1978, the production of frozen strawberries would reach 16,000 m.t. and the export of the fruit would earn \$7 million. To handle the increased output, five additional mushroom plants would be equipped with freezing facilities in or around 1977. In addition to strawberries, the cultivation and freezing of such other fruits as raspberries, blueberries and blackberries would also be developed. Also, a strawberry plant propagation center would be established to supply guaranteed disease-free plants to farmers.

Other Agricultural Products

Increased efforts would be made to develop the production of other fruits and vegetables suitable for processing with the aim of further stimulating agro-industrial development in Korea.

Marketing and Technical Services

A unitary export marketing unit would be set up under the aegis of the AFDC, which has already begun to serve as a principal export agency for mushroom and other agricultural exports from Korea. The objectives of the unitary marketing unit would be to obtain better prices and ensure proper export performances. A central warehousing facility would be constructed to expedite the collecting and storing of export products.

A technical training center would be established to train processing technicians and quality control personnel in conjunction with the introduction of improved processing facilities and technology. Also, a research institute would be created to conduct scientific, technical and economic studies on the development of an integrated agricultural products processing industry.

The processing firms participating in the Project would furnish agricultural extension services to farmers in cooperation with the Office of Rural Development and its branches. The following tables show the raw material production development schedule and a recapitulation of the objectives of the Project.

Raw Material Production Development Schedule

(1) Physical Facilities (1972-1976)

| Province | Mushroom Houses (pyong) ^{1/} | | | Asparagus Farms (ha) | Strawberry Farms (ha) |
|------------------|---------------------------------------|---------|---------|----------------------|-----------------------|
| | Existing | New | Total | Total New | Total New |
| Chungchong-Pukto | 0 | 15,000 | 15,000 | - | - |
| Chungchong-Namdo | 57,390 | 83,610 | 141,000 | 100 | 360 |
| Cholla-Pukto | 59,150 | 46,830 | 105,980 | 50 | 360 |
| Cholla-Namdo | 36,978 | 54,422 | 91,400 | - | 360 |
| Kyongsang-Pukto | 59,095 | 106,041 | 165,136 | 150 | 360 |
| Kyongsang-Namdo | 34,695 | 85,305 | 120,000 | 100 | 360 |
| Total | 247,308 | 391,208 | 638,516 | 400 | 1,800 |

^{1/} One pyong equals 3.3 square meters.

(2) Raw Material Output

(In metric tons)

| Year | Mushrooms | | Asparagus | | Strawberries | |
|------|------------|--------------------|-------------|--------------------|--------------|--------------------|
| | Raw Tissue | Quantity Processed | Raw Product | Quantity Processed | Raw Product | Quantity Processed |
| 1971 | 11,362 | 9,089 | | | | |
| 1972 | 16,991 | 13,632 | | | | |
| 1973 | 23,316 | 19,586 | | | 800 | 650 |
| 1974 | 29,550 | 25,413 | 46 | | 2,500 | 2,090 |
| 1975 | 36,549 | 32,163 | 280 | 204 | 6,000 | 5,000 |
| 1976 | 40,865 | 36,778 | 764 | 564 | 8,000 | 7,100 |
| 1977 | 40,865 | 36,778 | 1,412 | 1,092 | 12,000 | 10,000 |
| 1978 | 40,865 | 36,778 | 2,160 | 1,824 | 18,000 | 15,000 |
| 1979 | 40,865 | 36,778 | 2,700 | 2,280 | 18,000 | 15,000 |
| 1980 | 40,865 | 36,778 | 3,000 | 2,400 | 18,000 | 15,000 |

Recapitulation of Project Objectives

| Category | Current Status <u>1/</u> | At Full Development <u>2/</u> |
|-------------------------------------------------------------------------|--------------------------|-------------------------------|
| I. <u>MUSHROOMS</u> | | |
| 1) Area of Culture Beds | 247,308 pyong <u>3/</u> | 638,516 pyong <u>3/</u> |
| 2) Raw Tissue Output | 11,362 m.t. | 40,865 m.t. |
| 3) Raw Tissue Yield per Pyong | 27 kg | 32 kg |
| 4) Quantity of Raw Tissue Needed to Produce One Standard Case <u>4/</u> | 22 kg | 19 kg |
| 5) Total Packout | 413,167 c/s <u>4/</u> | 1,935,710 c/s |
| 6) Export Price per Case | US\$17 | US\$17 |
| 7) Total Export Value | US\$6,708,000 | US\$32,420,000 |
| 8) Number of Processing Plants | 33 | 41 |
| 9) Area of Culture Beds per Processor | 7,500 pyong | 15,000 pyong |
| 10) Processing Capacity per Plant | 7 m.t./day | 12 m.t./day |
| 11) Spawn Requirement per Year | 841,632 lbs | 2,554,064 lbs |
| 12) Spawn Production Capacity | 1,020,000 lbs/yr. | 3,000,000 lbs/yr. |
| 13) Number of Propagation Centers | 6 | 10 |
| 14) Rice Straw Requirement <u>5/</u> | 50,497 m.t./yr. | 153,243 m.t./yr. |
| 15) Export Channel | Multiple | Single |

| Category | Current Status <u>1/</u> | At Full Development <u>2/</u> |
|------------------------------------------|--------------------------|-------------------------------|
| 16) Export Center | None | In operation |
| 17) Design of Mushroom Growing Houses | No consistency | Standardization |
| II. <u>ASPARAGUS 6/</u> | | |
| 1) Area under Cultivation | - | 400 ha. |
| 2) Quantity Harvested | - | 3,000 m.t. |
| 3) Yield per Ha | - | 6 m.t./yr. |
| 4) Total Packout | - | 180,000 c/s <u>7/</u> |
| 5) Export Price per Case <u>7/</u> | - | US\$9 |
| 6) Total Export Value | - | US\$1,620,000 |
| 7) Number of Processing Plants <u>8/</u> | - | 2 |
| 8) Asparagus Acreage per Processor | - | 200 ha. |
| 9) Processing Capacity per Plant | - | 20 m.t./day |
| III. <u>STRAWBERRIES</u> | | |
| 1) Area under Cultivation | - | 1,800 ha. |
| 2) Quantity Harvested | - | 18,000 m.t. |
| 3) Yield per Ha | - | 10 m.t. |
| 4) Total Packout | - | 16,000 m.t. |
| 5) Export Price per Metric Ton | - | US\$550 |

| Category | Current Status <u>1/</u> | At Full Development <u>2/</u> |
|------------------------------------------|--------------------------|-------------------------------|
| 6) Total Export Value | - | US\$7,200,000 |
| 7) Number of Processing Plants <u>9/</u> | - | 5 |
| 8) Strawberry Acreage per Processor | - | 360 ha. |
| 9) Processing Capacity per Plant | - | 50 m.t./day |

1/ Projected status as of the end of 1971.

2/ Dates of full development are 1976 for mushrooms, 180 for asparagus and 1978 for strawberries.

3/ One pyong equals 3.3 square meters.

4/ One standard case contains 24 16-oz. cans.

5/ Rice straw is the principal material for making compost needed for mushroom culture.

6/ The proposed asparagus sub-project comprises pilot-type operations alone; the real asparagus development potential is not reflected in the projections.

7/ In terms of standard cases each containing 24 16-oz. cans.

8/ Asparagus processing lines would be annexed to mushroom processing plants.

9/ Strawberry processing lines would also be annexed to mushroom plants.

D. Cost Estimates

The total cost of the Project is estimated at Won 17,158 million (US\$46.4 million), including working capital for processing plants and farms. The foreign exchange requirement of the Project would be only US\$3 million. Principal foreign exchange items would be certain types of mushroom processing equipment and strawberry freezing facilities which would have to be imported. Project costs are summarized in the following table.

Estimated Project Costs

| Category | Won (Million) | | | US\$ (Thousand) ^{1/} | | | % Foreign Exchange |
|---------------------------------------------------|---------------|--------------|----------------------|-------------------------------|--------------|----------------------|--------------------|
| | Local | Foreign | Total | Local | Foreign | Total | |
| 1. <u>Processing Facilities</u> | | | | | | | |
| A) Mushroom | 1,971 | 725 | 2,696 | 5,327 | 1,959 | 7,286 | 27 |
| B) Asparagus | 20 | - | 20 | 54 | - | 54 | - |
| C) Strawberry | 494 | 381 | 875 | 1,335 | 1,030 | 2,365 | 44 |
| Sub-total | 2,485 | 1,106 | <u>3,591</u> | 6,716 | 2,989 | <u>9,705</u> | 31 |
| 2. <u>Agricultural Production</u> | | | | | | | |
| A) Mushroom | | | | | | | |
| Growing Houses | 3,912 | - | 3,912 | 10,573 | - | 10,573 | |
| Propagation Centers | 260 | - | 260 | 703 | - | 703 | |
| B) Asparagus | | | | | | | |
| Land Purchase, Planting & Maintenance | 433 | - | 433 | 1,170 | - | 1,170 | |
| C) Strawberry | | | | | | | |
| Propagation Center | 10 | - | 10 | 27 | - | 27 | |
| Sub-total | 4,615 | - | <u>4,615</u> | 12,473 | - | <u>12,473</u> | - |
| 3. <u>Marketing and Technical Services</u> | | | | | | | |
| Export Center | 300 | - | 300 | 811 | - | 811 | |
| Technical Training | 63 | - | 63 | 170 | - | 170 | |
| Extension Services | 153 | - | 153 | 414 | - | 414 | |
| Propagation Assistance | 1,682 | - | 1,682 | 4,546 | - | 4,546 | |
| Sub-total | 2,198 | - | <u>2,198</u> | 5,941 | - | <u>5,941</u> | |
| 4. <u>Working Capital</u> | | | | | | | |
| Packers | 5,012 | - | 5,012 | 13,546 | - | 13,546 | |
| Farmers | 1,742 | - | 1,742 | 4,708 | - | 4,708 | |
| Sub-total | 6,754 | - | <u>6,754</u> | 18,254 | - | <u>18,254</u> | |
| Total | 16,052 | 1,106 | <u>17,158</u> | 43,384 | 2,989 | <u>46,373</u> | 6.4 |

^{1/} Foreign exchange rate applied: US\$1.00 = Won 370

E. Financing

It is proposed that an international development loan be made to cover 6,500 million won (\$17.7 million) of the total estimated project costs of 17,100 million won (\$46.4 million). The proposed loan would finance 38% of the total cost. The proposed sources of financing and their applications would be as follows:

(1) Fixed Investments

- a) Farmers would contribute 20% of the construction costs of mushroom growing houses and processors would meet 30% of the fixed capital requirement of plant equipment and facilities.

Thus local sources would contribute 1,900 million won towards the total fixed investment requirement of 7,900 million won, and the proceeds of the proposed international loan would cover the remaining 6,000 million.

- b) The 570 million won needed to expand propagation centers and to establish an Export Center would be invested by the AFDC, and the financial resources for the AFDC investment would be derived from the proceeds of the international loan.

(2) Working Capital

- a) Eighty per cent of the working capital requirements of the processing plants, mushroom growing houses and crop farms would be met from the Export Financing Loan Fund sponsored by the Government, with the remaining 20% to be filled by packers and growers themselves.
- b) The Government would subsidize 80% of the costs of spawn and young plants to be distributed to the farmers, with the farmers paying for the remaining 20%.
- c) The Government would provide for 60 million won in subsidies to cover the full costs of training farmers at the proposed training centers. The expenses for agricultural extension services would be equally shared by the Government and the processing firms.

Further details of the financing plan are given in the following table.

Sources of Financing

(1) Summary

(In millions of won)

| Category | Domestic Sources | | | | | International Sources | | | Grand Total |
|----------------------------------------------------------|--------------------|------------------------|------------------|--------------|---------------|-----------------------|------------------|---------------|---------------|
| | Government Subsidy | Export Financing Loans | Processing Firms | Farmers | Total | Local Currency | Foreign Exchange | Total | |
| I. <u>Fixed Assets</u> | | | | | | | | | |
| Processing Facilities | | | 1,077 | | 1,077 | 1,408 | 1,106 | 2,514 | 3,591 |
| Agric. Production | | | 87 | 782 | 869 | 3,477 | | 3,477 | 4,346 |
| Propagation Centers | | | | | | 270 | | 270 | 270 |
| Export Center | | | | | | 300 | | 300 | 300 |
| Sub-total | | | 1,164 | 782 | 1,946 | 5,455 | 1,106 | 6,561 | 8,507 |
| II. <u>Working Capital</u> | | | | | | | | | |
| Processing Facilities | | 4,008 | 1,004 | | 5,012 | | | | 5,012 |
| Agric. Production | | 1,394 | 276 | 72 | 1,742 | | | | 1,742 |
| Propagation | 1,351 | | | 330 | 1,681 | | | | 1,681 |
| Sub-total | 1,351 | 5,402 | 1,280 | 402 | 8,435 | | | | 8,435 |
| III. <u>Technical Services</u> | | | | | | | | | |
| Training Centers | 62 | | | | 62 | | | | 62 |
| Extension Services | 77 | | 5 | 72 | 154 | | | | 154 |
| Sub-total | 139 | | 5 | 72 | 216 | | | | 216 |
| Total | 1,490 | 5,402 | 2,449 | 1,256 | 10,597 | 5,455 | 1,106 | 6,561 | 17,158 |
| US\$ Equivalent ^{1/} (\$1,000) | 4,027 | 14,600 | 6,619 | 3,395 | 28,641 | 14,743 | 2,989 | 17,732 | 46,373 |

(2) Mushrooms

(In millions of won)

| Category | Domestic Sources | | | | | International Sources | | | Grand Total |
|--------------------------------|--------------------|------------------------|------------------|---------|-------|-----------------------|------------------|-------|-------------|
| | Government Subsidy | Export Financing Loans | Processing Firms | Farmers | Total | Local Currency | Foreign Exchange | Total | |
| I. <u>Fixed Assets</u> | | | | | | | | | |
| Processing Facilities | | | 809 | | 809 | 1,162 | 725 | 1,887 | 2,696 |
| Agric. Production | | | | 782 | 782 | 3,130 | - | 3,130 | 3,912 |
| Propagation Centers | | | | | | 260 | - | 260 | 260 |
| Export Center | | | | | | 300 | - | 300 | 300 |
| Sub-total | | | 809 | 782 | 782 | 4,852 | 725 | 5,577 | 7,168 |
| II. <u>Working Capital</u> | | | | | | | | | |
| Processing | | 3,322 | 831 | | 4,153 | | | | 4,153 |
| Agric. Production | | 1,022 | 255 | | 1,277 | | | | 1,277 |
| Propagation | 1,320 | | | 330 | 1,650 | | | | 1,650 |
| Sub-total | 1,320 | 4,344 | 1,086 | 330 | 7,080 | | | | 7,080 |
| III. <u>Technical Services</u> | | | | | | | | | |
| Training Centers | 62 | | | | 62 | | | | 62 |
| Extension Services | 54 | | | 54 | 108 | | | | 108 |
| Sub-total | 116 | | | 54 | 170 | | | | 170 |
| Total | 1,436 | 4,344 | 1,895 | 1,166 | 8,841 | 4,852 | 725 | 5,577 | 14,418 |

(3) Asparagus

(In millions of won)

| Category | Domestic Sources | | | | | International Sources | | | Grand Total |
|---------------------------------------|--------------------|------------------------|------------------|---------|------------|-----------------------|------------------|------------|-------------|
| | Government Subsidy | Export Financing Loans | Processing Firms | Farmers | Total | Local Currency | Foreign Exchange | Total | |
| I. <u>Fixed Assets</u> | | | | | | | | | |
| Processing Facilities | | | 6 | | 6 | 14 | | 14 | 20 |
| Agric. Production | | | 87 | | 87 | 347 | | 347 | 434 |
| Propagation Centers | | | | | | | | | - |
| Export Center | | | | | | | | | - |
| Sub-total | | | 93 | | 93 | 361 | | 361 | 454 |
| II. <u>Working Capital</u> | | | | | | | | | |
| Processing | | 166 | 43 | | 209 | | | | 209 |
| Agric. Production | | 84 | 21 | | 105 | | | | 105 |
| Propagation | 16 | | | | 16 | | | | 16 |
| Sub-total | 16 | 250 | 64 | | 330 | | | | 330 |
| III. <u>Technical Services</u> | | | | | | | | | |
| Training Centers | | | | | | | | | |
| Extension Services | 5 | | 5 | | 10 | | | | 10 |
| Sub-total | 5 | | 5 | | 10 | | | | 10 |
| Total | 21 | 250 | 162 | | 433 | 361 | | 361 | 794 |

(4) Strawberries

(In millions of won)

| Category | Domestic Sources | | | | | International Sources | | | Grand Total |
|--------------------------------|----------------------------|------------------------------|---------------------|---------|-------|-----------------------|---------------------|-------|-------------|
| | Govern- ment Subsidy | Export Financing Loans | Processing Firms | Farmers | Total | Local Currency | Foreign Exchange | Total | |
| I. <u>Fixed Assets</u> | | | | | | | | | |
| Processing Facilities | | | 262 | | 262 | 232 | 381 | 613 | 875 |
| Agric. Production | | | | | | | | | - |
| Propagation Centers | | | | | | 10 | | 10 | 10 |
| Export Center | | | | | | | | | - |
| Sub-total | | | 262 | | 262 | 242 | 381 | 623 | 885 |
| II. <u>Working Capital</u> | | | | | | | | | |
| Processing Facilities | | 520 | 130 | | 650 | | | | 650 |
| Agric. Production | | 288 | - | 72 | 360 | | | | 360 |
| Propagation | 15 | | | | 15 | | | | 15 |
| Sub-total | 15 | 808 | 130 | 72 | 1,025 | | | | 1,025 |
| III. <u>Technical Services</u> | | | | | | | | | |
| Training Centers | | | | | | | | | |
| Extension Services | 18 | | | 18 | 36 | | | | 36 |
| Sub-total | 18 | | | 18 | 36 | | | | 36 |
| Total | 33 | 808 | 392 | 90 | 1,323 | 242 | 381 | 623 | 1,946 |

F. Prototype Plant

(a) General Description

One purpose of the Project is to facilitate the development of individual processing facilities on a sufficiently large scale to ensure commercial viability. Mushroom processing would be the key component of the proposed multiproduct plant. The mushroom has been selected as the principal product in light of the following considerations:

1. The production of mushrooms can be quickly developed.
2. The export demand for Korean mushrooms is quite strong.
3. Mushroom culture requires very little land -- a very important factor to land-scarce Korea.
4. Because the mushroom is a labor-intensive crop, it can contribute significantly to cash incomes of the farmers.
5. The techniques for mushroom culture and processing have already been fairly well disseminated among farmers and processors.
6. The AFDC has successfully developed a pilot-type mushroom production and processing project through which advanced techniques have been achieved to

serve as the model for the industry.

The proposed prototype plant would bear a capacity to process 12 m.t. of raw mushroom tissue per eight hours, and would be supplied from 15,000 pyong of mushroom culture beds (one pyong equals 3.3 square meters). The processing firm itself would own and operate 6,000 pyong, with the remaining 9,000 pyong operated by farmers under contracts with the processor.

As an illustration, an imaginary firm called Kyongnam Agricultural Processing Company (KAPCO) has been founded to develop an integrated mushroom enterprise.

(b) Finance and Sales

KAPCO's equity capital would be 55,000,000 won. Its mushroom processing plant would cost 105,000,000 won (including US\$40,000 worth of imported equipment) and its mushroom growing houses 86,900,000 won. The total fixed assets would thus amount to 192,910,000 won. The working capital requirement of KAPCO for mushroom culture and processing would be 73,237,000. Thus its overall capital investment requirement would be 266,137,000 won.

In the initial year of its operation, however, KAPCO would start with a processing capacity of 6 m.t./day, and the raw tissue supply would come from 6,000 pyong of culture beds of its own. In the second year, the processing capacity would be doubled to 12 m.t./day, and farmers in the vicinity would build growing houses having

a total of 3,000 pyong of culture beds to provide an additional raw tissue supply to the KAPCO plant. The area of culture beds operated by contracting farmers would again be increased by 3,000 pyong in the third year and by yet another 3,000 pyong in the fourth year.

KAPCO would borrow money in the first and second years of its existence to finance the construction of its plant and growing houses. Partly because of the interest burden, KAPCO would operate in the red during the first two years. But as the volume of production and sales increase, KAPCO would earn a profit of 7,890,000 won in the third year. Its profits would rise to 39,936,000 won in the fourth year and to 73,649,000 in the fifth year, when the firm's mushroom enterprise reaches full development. In view of the high earning rate there would be no problem in amortizing the firm's long-term debts. Moreover, there would be enough cash generation, even after the amortization, for KAPCO to finance its operation on its own. If KAPCO were supplied from only 12,000 pyong of mushroom beds, it would still be able to maintain debt servicing, but would not be able to earn enough profits to pay dividends at a reasonable rate. Therefore, 15,000 pyong is considered to be the minimum desirable scale of production.

The mushroom sales volume of KAPCO would increase from \$134,000 (44 million won) in the first year to \$858,000 (283 million won) by the fifth year. Quantitywise, its output would increase from 7,000 standard cases to 48,000 cases by the fifth year. KAPCO's raw tissue

procurement would increase from 168,000 kilograms in the initial year to almost one million kilos in the fifth year.

The total sales volume and profit-earning power of KAPCO would increase further when such other products as asparagus and strawberries are added to its processing lines.

(c) Profitability Indicators

Under the current world market price structure for the products covered by the Project, the prototype company would be able to achieve reasonably high profitability. The high profitability expected under the Project is attributable largely to the cultivation of high-yield varieties newly introduced into Korea, and the utilization of integrated processing equipment. The following table shows profitability indicators applicable to the proposed multiproduct processing plant at full development.

| <u>Products</u> | <u>Ratio of Net Profit to Total Capital</u> | <u>Ratio of Net Profit to Net Sales</u> | <u>Internal Rate of Return</u> |
|-----------------|-----------------------------------------------------|-------------------------------------------------|----------------------------------------|
| Mushrooms | 34% | 26% | 20% |
| Asparagus | 40% | 29% | 25% |
| Strawberries | 37% | 28% | 23% |

G. Markets

(a) Mushrooms

The world consumption of mushrooms has been steadily increasing in recent years, with the amount of mushrooms entering into international trade rising steeply. Taiwan is currently the world's largest exporter of mushrooms, having achieved very sharp increases in mushroom sales in the past several years.

Korea is rapidly emerging as an important source of mushroom supply to the international market. Mushroom consumption in developed countries has been rising year after year, but mushroom production in such countries has become stagnated because of high labor costs. Korea is now afforded an excellent opportunity to establish herself as a major supplier to the world mushroom markets. The following table indicates the trends in world mushroom trade in recent years.

World Mushroom Trade

(In thousands of U.S. Dollars)

| Exporting Country | 1965 | 1966 | 1967 | 1968 | 1969 |
|--------------------|--------|--------|--------|--------|--------|
| TOTAL WORLD EXPORT | 36,000 | 43,200 | 56,400 | 63,600 | 72,105 |
| Taiwan | 19,419 | 25,076 | 30,300 | 30,600 | 29,051 |
| France | | 6,534 | 8,974 | 11,909 | 15,191 |
| Holland | | 2,505 | 3,818 | 5,756 | 10,862 |
| Japan | | 516 | 637 | 1,258 | 1,657 |
| Korea | | 339 | 490 | 303 | 1,346 |

Source: Korea Trade Promotion Corp., "Export Markets 1970"

(b) Asparagus

The world markets for asparagus have also been expanding rapidly, with Taiwan firmly established as the major supplier. On the other hand, asparagus production in the United States, once the major asparagus exporter, has been declining gradually owing to difficulty in obtaining labor to work on asparagus farms. In the past, white asparagus was favored by consumers, especially in Europe. More recently, green asparagus has become more popular than white asparagus in the United States, and such change in consumer preference is taking place in Europe, too.

In Taiwan, it is rather difficult to produce green asparagus because of climatic reasons. The climatic conditions in Korea are favorable for the production of green asparagus, which is easier to cultivate than the white variety. Thus prospects are good for large-scale cultivation and packing of green asparagus in Korea for export markets.

In 1958, the United States share of the asparagus import market in West Germany, the world's leading asparagus importer, was 93%. But the U.S. share of the German market dropped to only 14% by 1967, while Taiwan's share of that market increased from only 2% in 1964 to 81% by 1967. The following table shows recent trends in world asparagus trade.

World Asparagus Trade

| Exporting Countries | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 |
|---------------------|--------|--------|--------|--------|--------|--------|
| TOTAL WORLD EXPORT | 46,136 | 50,605 | 57,053 | 59,453 | 69,724 | 78,336 |
| Taiwan | - | - | 18,544 | 35,345 | 42,230 | 66,509 |
| U.S. | 35,187 | 26,467 | 16,493 | 10,800 | - | - |
| Japan | 1,134 | 1,268 | 377 | 1,166 | 1,570 | - |

Source: The Almanac, Westminster 1969; Republic of China External Trade Yearbook 1970; Cannery Association of Japan.

(c) Strawberries

The principal markets for the strawberry products (frozen and hot pack, jams, etc.) would be the United States and Japan. Strawberry consumption in both countries have been increasing sharply in recent years. In the United States, domestic production has been leveling off, and imports, principally from Mexico, have been increasing rapidly. But strawberry production in Mexico has reached a plateau, leading to a significant supply gap in frozen strawberries in the U.S. Japan's own production of strawberries has been increasing in recent years. But strawberry prices in Japan are high, and the AFDC has been receiving frequent inquiries from Japanese firms about the possibility of supplying frozen Korean strawberries to Japan. Also, the import of strawberry jams into Japan has been brisk in recent years. The following table shows trends in the strawberry markets in the United States and Japan.

Strawberry Markets in the U.S. and Japan

| Country | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 |
|-------------------------------------------|--------|--------|---------|---------|---------|---------|
| <u>The United States:</u> | | | | | | |
| Domestic production, m.t. | | | | 236,590 | 220,772 | 224,863 |
| Rate of increase over previous year, % | | | | | -6.7 | 1.8 |
| Imports, m.t. | | | 29,694 | 37,441 | 40,672 | 46,556 |
| Rate of increase over previous year, % | | | | 26.1 | 8.6 | 14.5 |
| <u>Japan:</u> | | | | | | |
| Domestic production, m.t. | 75,500 | 96,800 | 109,100 | 121,000 | 133,700 | - |
| Rate of increase over previous year, % | 0.3 | 28.2 | 12.7 | 10.9 | 10.5 | - |

Source: American Institute of Food Distribution, "Report on Food Markets";
Bureau of Census, U.S.A.; Japanese Ministry of Agriculture and
Forestry.

IV. ORGANIZATION AND MANAGEMENT

A. Project Administration

The Agriculture and Fishery Development Corporation would be the principal executing agency of the Project. The AFDC is a statutory body subject to broad supervision by the Minister of Agriculture and Forestry. It is planned to create an Agro-Industry Department within the AFDC to administer day-to-day operations of the Project.

An Agro-Industry Development Council would be set up to coordinate the activities of all the parties involved, namely, the Ministry of Agriculture and Forestry, the AFDC, the Office of Rural Development, the association of spawn producers, the National Agricultural Cooperative Federation, the associations of growers, the association of packers, etc.

The Council would establish policies and guidelines on production and export, raw materials development, financing for farming and processing, export pricing, extension services and all other important matters relating to the Project.

B. Lending Operations

All loan funds for the project -- Government, foreign and AFDC -- would be channeled through the AFDC to ensure coordinated and timely financing. AFDC subloans for the development of processing activities would be extended directly to processing firms. Subloans

for agricultural production development would be channeled through the processing firms to the farmers under contracts with the processors. The borrowing farmers would repay their debts by having deducted a portion of the proceeds from the sale of their products to the packers. The AFDC would strongly encourage the borrowing processors to adopt the prototype plant design developed by the AFDC engineering staff. One AFDC prototype plant has already been established at Puyo, Chungchong-Namdo, and its high efficiency and product quality is now being widely recognized by the Government and industry circles. Subloans to farmers would be supervised loans linked to extension services. Farmers would also be encouraged to adopt the standard growing house designs developed by the AFDC technical staff.

G. Marketing and Technical Services

The AFDC, with its head office in Seoul, would perform the following functions with a view to ensuring successful implementation of the Project:

- 1) Provision of technical information, guidance and training to help maintain effective agricultural extension services.
- 2) Operation of a research institute to develop better ways of growing and processing agricultural products and to help solve various technical problems encountered in factories and on farms.

- 3) Export marketing services to facilitate the sales of processed products by participating firms and maintain favorable prices for Korean products. This would include operation of a central warehousing facility in Pusan.
- 4) Supply of tin cans, cartons, labels and other materials needed for the processing industry; the unified procurement and supply system would help ensure standardization, reliable quality and fulfillment of export contracts.
- 5) Assistance in quality control of products and in improving processing techniques and developing diversified products. A training center for processing technicians would be set up.
- 6) Evaluation of loan applications by sub-borrowers and administration of subloans.
- 7) Export inspection services on behalf of the Government.
- 8) Assistance in designing and constructing processing plants, mushroom growing houses, farms and orchards.
- 9) Development and administration of unified national brands for the products of participating firms.

V. PROPOSED LOAN FUND

It is proposed that a loan fund of US\$25 million be made available to the AFDC by an international development finance organization to carry out the Project in conjunction with local financial resources. The proposed loan fund would principally be intended to generate Korean currency funds needed to make subloans to farmers and processors.

The reasons for seeking an arrangement to utilize a hard currency loan mainly to generate local currency are as follows:

- (a) In the categories of farm development planned under the project, the need for imported equipment and materials is very small, whereas the local currency requirement is heavy. For instance, cement, steel materials and most types of equipment needed to construct and operate mushroom growing houses can all be procured locally. Fertilizers and pesticides are also readily available within the country.
- (b) In constructing and operating processing plants also, most of the equipment and materials needed can be manufactured locally. Only the most sophisticated instruments, controls and machines would be imported.
- (c) Ordinary types of motor vehicles are also assembled locally by combining imported and domestic parts and components.

Because of the reasons stated above, the usual type of international

development loans, intended to finance only the foreign exchange components of a project, will bear little relevancy to the Project.

Further description of the loan fund follows:

- (a) Amount: US\$18 million equivalent in convertible currencies.
- (b) Purpose: To assist through the AFDC in financing the development and improvement of an integrated multiproduct food processing industry centered on such high-growth export products as mushrooms, asparagus and strawberries.
- (c) Amortization: In 15 years including a 3-year period of grace.
- (d) Interest Rate: 7.5% annually.
- (e) Relending Terms: Interest will range between 9 per cent and 12 per cent and repayments from 7 to 12 years including a 3-year period of grace according to the type of project.

VI. BENEFITS TO THE NATIONAL ECONOMY

The proposed project would contribute greatly to the development of industries producing, storing, processing and marketing agricultural products -- which are currently among the least developed segments of Korea's industry.

Development of agro-industry would go a long way in stimulating and facilitating rural development, thereby serving to narrow the wide income gap between the rural and urban sectors of the Korean economy. The consequent progress in rural industrialization would also moderate the current trend toward heavy concentration of population in large cities, which is causing various difficult socio-economic problems.

Moreover, the sharp increases in agricultural exports anticipated to be achieved under the Project would contribute substantially to improving the balance of payments position of Korea, now burdened with a large trade gap.

Also, enlarged outlets for various agricultural products other than traditional staple foodstuffs would expedite diversification of farming, leading to greater capabilities of Korea's agriculture to meet the expanding domestic demands for a larger variety of farm products due to the continuing economic growth. The development of a food processing industry integrated with local agricultural production would serve to enrich the Korean diet, as well as expand the country's exporting ability.

Development of agribusiness is a key factor in the economic development program of the Government, in light of the fact that Korea's Third Five-Year Plan places special emphasis on agricultural development. In sum, development of agro-industry would facilitate the transformation of Korea's agriculture, now dominated by family-type subsistence farming, into commercially viable enterprise. This would certainly be an essential step toward more satisfactory Korean national development.

The Project would also have quite a considerable effect on the growth of such allied industries as those manufacturing containers (tin cans, glass jars, etc.), packaging materials (cartons, pallets, labels, plastics, etc.), and processing equipment.

INTEGRATED AGRICULTURAL PRODUCTS PROCESSING PROJECT PROJECT AREAS

- Provincial Boundaries
- +++++ Rail ways
- Provincial Capitals
- Existing Mushroom Processing Plants
- New Mushroom Processing Plants
- Asparagus Processing Plants
- ▨ Asparagus Producing Areas
- Strawberry Processing Plants
- ▨ Strawberry Producing Areas



YELLOW SEA

EAST SEA

KOREAN STRAIT

CHEJU STRAIT

CHE JU

PUSAN

TAE GU

CHON JU

KWANG JU

TAE JON

CHUNG JU

SEOUL

CHUN CHON

